

CLAIMS

in Patent Application entitled

HIGH-FREQUENCY POWER SUPPLY FOR INCANDESCENT LAMP

1. An arrangement comprising:

a source providing an AC power line voltage at a pair of power line terminals;

incandescent lamp having a pair of lamp terminals; and power supply connected between the power line terminals and the lamp terminals; the power supply being operative to provide an AC lamp voltage across the lamp terminals; the AC lamp voltage having: (i) a fundamental frequency at least twenty times higher than that of the AC power line voltage; (ii) numerous complete half-cycles during each complete half-cycle of the AC power line voltage, with each of the numerous complete half-cycles having a peak magnitude; and (iii) the absolute value of the peak magnitude of the numerous complete half-cycles varying in time such as to be proportional to the absolute value of the instantaneous peak magnitude of the AC power line voltage, at least during a substantial portion of each half-cycle of the AC power line voltage.

2. The arrangement of claim 1 wherein said substantial portion represents more than half of the total half-period of each cycle of the AC power line voltage.

3. The arrangement of claim 1 wherein the RMS magnitude of the AC <sup>lamp</sup> voltage is substantially lower than that of the AC power line voltage.

4. The arrangement of claim 1 wherein the fundamental frequency of the AC lamp voltage is equal to, or higher than, about 10 kHz.

5. The arrangement of claim 1 wherein the AC lamp voltage is a squarewave voltage amplitude-modulated at a frequency equal to twice the fundamental frequency of the AC power line voltage.

6. The arrangement of claim 1 wherein the power supply includes: (i) rectifier connected with the power line terminals and operative to provide a DC voltage at a set of DC terminals, the DC voltage having an absolute instantaneous magnitude about equal to that of the AC power line voltage; and (ii) inverter means connected between the DC terminals and the lamp terminals.

7. An arrangement comprising:

a source providing an AC power line voltage at a pair of power line terminals;

incandescent lamp having a pair of lamp terminals; and power supply connected between the power line terminals and the lamp terminals; the power supply being operative to provide an AC lamp voltage across the lamp terminals; the AC lamp voltage having: (i) a fundamental frequency significantly higher than that of the AC power line voltage; and (ii) at least during a substantial portion of each half-cycle of the AC power line voltage, an instantaneous absolute magnitude proportional to that of the AC power line voltage.

8. The arrangement of claim 7 wherein the RMS magnitude of the AC lamp voltage is substantially lower than that of the AC power line voltage.

9. The arrangement of claim 7 wherein the AC lamp voltage is a squarewave voltage having a fundamental frequency equal to or higher than about 10 kHz and being amplitude-modulated at a frequency equal to twice the fundamental frequency of the AC power line voltage.

10. The arrangement of claim 7 wherein said substantial portion represents over half of the total half-period of each cycle of the AC power line voltage.

11. The arrangement of claim 7 wherein the power supply includes: (i) a rectifier connected with the power line terminals and operative to provide a DC voltage at a set of DC terminals, the DC voltage having an absolute instantaneous magnitude about equal to that of the AC power line voltage; and (ii) an inverter means connected between the DC terminals and the lamp terminals.

12. An arrangement comprising:

a source providing AC power line voltage at a pair of power line terminals;

an incandescent lamp having a pair of lamp terminals;

a rectifier connected with the power line terminals and operative to provide at a pair of DC terminals an unfiltered DC voltage having an absolute instantaneous magnitude about equal to that of the AC power line voltage; and

an inverter connected between the DC terminals and the lamp terminals; the inverter being powered by the unfiltered DC voltage and operative to provide a lamp voltage across the lamp terminals; the lamp voltage being an alternating voltage of fundamental frequency substantially higher than that of the AC power line voltage.

13. The arrangement of claim 12 wherein: (i) the lamp voltage has a peak-to-peak absolute magnitude that varies in time at a frequency equal to twice that of the AC power line voltage; (ii) the peak-to-peak absolute magnitude has a maximum value that re-occurs at a rate equal to twice the frequency of the AC power line voltage; and (iii) the lamp voltage has an absolute instantaneous magnitude that never exceeds the absolute instantaneous magnitude of a sinusoidal voltage with frequency equal to that of the AC power line voltage and peak-to-peak absolute magnitude equal to said maximum value.

14. The arrangement of claim 13 wherein the lamp voltage is a squarewave voltage of frequency equal to, or higher than, about 10 kHz.

15. The arrangement of claim 13 wherein the alternating voltage: (i) has a frequency equal to, or higher than, about 10 kHz; (ii) has a peak-to-peak absolute magnitude that is periodically modulated in time at a frequency equal to twice that of the AC power line voltage; and (iii) has a peak-to-peak absolute magnitude that is, at least during a substantial part of each half-cycle of the AC power line voltage, proportional to the instantaneous absolute magnitude of the AC power line voltage.

16. The arrangement of claim 13 wherein: (i) the lamp voltage consists of periodic bursts of high-frequency alternating voltage; (ii) the high-frequency alternating voltage having a frequency of about 10 kHz or higher; and (iii) the periodic bursts occur at a rate equal to twice the frequency of the AC power line voltage.

17. An arrangement comprising:

a source providing AC power line voltage at a pair of power line terminals;

an incandescent lamp having a pair of lamp terminals;

a power supply connected between the power line terminals and the lamp terminals; the power supply being operative to provide a lamp voltage across the lamp terminals; the lamp voltage consisting of periodic bursts of high-frequency alternating voltage; the high-frequency alternating voltage having a fundamental frequency equal to, or higher than, about 10 kHz; each burst of high-frequency alternating voltage having a certain maximum peak-to-peak absolute magnitude; the absolute instantaneous magnitude of the lamp voltage never exceeding the absolute instantaneous magnitude of a substantially sinusoidal voltage with frequency equal to that of the AC power line voltage and peak-to-peak absolute magnitude equal to said maximum peak-to-peak absolute magnitude.

18. The arrangement of claim 17 wherein the periodic bursts of high-frequency alternating voltage occur at a rate equal to twice the frequency of the AC power line voltage.

19. The arrangement of claim 18 wherein the power supply includes: (i) rectifier connected with the power line terminals and operative to provide a DC voltage at a set of DC terminals, the DC voltage having an absolute instantaneous magnitude about equal to that of the AC power line voltage; and (ii) inverter means connected between the DC terminals and the lamp terminals.

20. The arrangement of claim 18 wherein the high-frequency alternating voltage is a squarewave voltage.